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SCIENCE

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE BOSTON MEETING

PLANS for the Fourth Boston Meeting of the association and associated societies are in a very satisfactory state of progress. The local arrangements are being very efficiently cared for by the local committee, whose chairman is Dr. S. C. Prescott, of the Massachusetts Institute. The secretary of the local committee is Mr. Arthur L. Townsend, also of the Massachusetts Institute. The preliminary announcement for the meeting will be sent, about December 1, to all whose names are on the roll of the association. As has been announced previously, those attending the meeting will have the benefit of special railway rates, a fare and a half for the round trip, on the certificate plan. This privilege is available for almost all of the United States and Canada.

The sessions will be held mainly in the buildings of the Massachusetts Institute of Technology, in Cambridge. These buildings have a floor-space of over fifteen acres. Each society will be able to have its session rooms near the rooms of the other societies, and still under the same roof.

Boston is well provided with good hotels and transportation facilities are very convenient. The announcement will contain the usual list of hotels, prices, etc. Those wishing to make arrangements for rooms before receiving the preliminary announcement should address the local representative of their society, care of the secretary of the local committee. It is better to address the hotel directly, which can be done immediately after receiving the announcement. The association hotel headquarters will be the Somerset Hotel.

Three general sessions are thus far arranged for the fourth Boston meeting. The opening session will be held on the evening of Tuesday,

December 26, in Walker Memorial Hall at the Massachusetts Institute. At this session the retiring president of the association, Professor E. H. Moore, of the University of Chicago, will deliver an address on "What is a Number System?" The president of the association, Dr. J. Playfair McMurrich, of the University of Toronto, will preside.

The second general session will be held on the evening of Wednesday, December 27, in Walker Memorial Hall. This session is to be under the joint auspices of the Society of Sigma Xi and the A. A. A. S. The address of the evening will be the Sigma Xi address, this year by President Livingston Farrand, of Cornell University, on "The Nation and its Health."

A general session will be held on Friday afternoon, December 29, in Huntington Hall, Rogers Building, on the old institute site, Boylston Street, Boston. On this occasion the William Thompson Sedgwick Memorial Lecture, under the auspices of the Massachusetts Institute, will be given by Professor Edmund B. Wilson, of Columbia University, on "The Physical Basis of Life."

The following list shows the societies, and the names of their secretaries, that have thus far informed the permanent secretary's office that they are planning to meet with the association at Boston:

Section A (Mathematics), William H. Roever, secretary; Washington University, St. Louis, Mo.

American Mathematical Society, R. G. D. Richardson, secretary; Brown University, Providence, R. I.

Mathematical Association of America, W. D. Cairns, secretary; Oberlin College, Oberlin, Ohio.

Section B (Physics), S. R. Williams, secretary; Oberlin College, Oberlin, Ohio. (Otto Koppius, of Oberlin College, will act as secretary for the Boston meeting, in Dr. Williams' absence in California).

American Physical Society, Dayton C. Miller, secretary; Case School of Applied Science, Cleveland, Ohio.

American Meteorological Society, Charles F. Brooks, secretary; Clark University, Worcester, Mass.

Section C (Chemistry), W. D. Harkins, acting secretary for the Boston meeting; University of Chicago, Chicago, Ill.

Section D (Astronomy), F. R. Moulton, secretary; University of Chicago, Chicago, Ill.

American Astronomical Society, Joel Stebbins, secretary; Washburn Observatory, Madison, Wis.

Section E (Geology and Geography), E. S. Moore, secretary; University of Toronto, Toronto, Canada.

Section F (Zoological Sciences), H. W. Rand, secretary; Harvard University, Cambridge, Mass.

American Society of Zoologists, W. C. Allee, secretary; University of Chicago, Chicago, Ill.

Entomological Society of America, C. L. Metcalf, secretary; University of Illinois, Urbana, Ill.

American Association of Economic Entomologists, Albert F. Burgess, secretary; Melrose Highlands, Mass.

Section G (Botany), Robert B. Wylie, secretary; State University of Iowa, Iowa City, Iowa.

Botanical Society of America, I. F. Lewis, secretary; University of Virginia, University, Va.

American Phytopathological Society, G. R. Lyman, secretary; Bureau of Plant Industry, Washington, D. C.

American Fern Society, Stewart H. Burnham, secretary; College of Agriculture, Ithaca, N. Y.

Sullivant Moss Society, Edward B. Chamberlain, secretary; 18 West Eighty-ninth Street, New York, N. Y.

Section F, G (Zoology and Botany).

American Society of Naturalists, A. Franklin Shull, secretary; University of Michigan, Ann Arbor, Mich.

Ecological Society of America, A. O. Weese, secretary; 1321 W. Wood Street, Decatur, Ill.

American Microscopical Society, Paul S. Welch, secretary; University of Michigan, Ann Arbor, Mich.

American Nature-Study Society, Anna Botsford Comstock, secretary; 123 Roberts Place, Ithaca, N. Y.

Section H (Anthropology), E. A. Hooton, secretary; Peabody Museum, Cambridge, Mass.

American Anthropological Association, A. V. Kidder, secretary; 215 Main Street, Andover, Mass.

Section I (Psychology), Frank N. Freeman, sec-

retary; University of Chicago, Chicago, Ill.

American Psychological Association, Edwin G. Boring, secretary; Clark University, Worcester, Mass.

Section K (Social and Economic Sciences), Frederick L. Hoffman, secretary, Babson Institute, Wellesley Hills, Mass.

American Metric Association, Howard Richards, secretary; 156 Fifth Avenue, New York, N. Y.

Section L (Historical and Philological Sciences), Frederick E. Brasch, secretary; 6963 Morton Place, Rogers Park, Chicago, Ill.

Section M (Engineering), L. W. Wallace, secretary; 719 Fifteenth Street, N. W., Washington, D. C.

Section N (Medical Sciences), A. J. Goldfarb, secretary; College of the City of New York, New York, N. Y.

Section O (Agriculture), P. E. Brown, secretary; Iowa State College, Ames, Iowa.

American Society of Agronomy, P. E. Brown, secretary; Iowa State College, Ames, Iowa.

Society of American Foresters, W. N. Sparhawk, secretary; Forest Service, Washington, D. C.

American Society for Horticultural Science, C. P. Close, secretary; College Park, Md.

Society for Promotion of Agricultural Science, J. G. Lipman, secretary; New Brunswick, N. J.

Section Q (Education), A. S. Barr, secretary; 1924 Hazelwood, Detroit, Mich.

Societies not specially related to any particular section:

The Society of Sigma Xi, Edward Ellery, secretary; Union College, Schenectady, N. Y.

Gamma Alpha Graduate Scientific Fraternity, A. H. Wright, secretary; 113 E. Upland Road, Ithaca, N. Y.

Phi Kappa Phi, L. H. Pammel, secretary; Ames, Iowa.

BURTON E. LIVINGSTON,
Permanent Secretary

AUTUMN MEETING OF THE EXECUTIVE COMMITTEE

THE meeting was called to order on October 21 at 2:10, in the office of Science Press, New York City, with the following members present: J. McKeen Cattell, H. L. Fairchild, W. J. Humphreys, Burton E. Livingston, Herbert Osborn, Henry B. Ward. Dr. Fairchild was elected chairman for the session. The following are the main items of business transacted:

1. The minutes of the last meeting of the committee having been already approved by mail, the permanent secretary read the minutes of the proceedings by mail and telegraph, in the interim since the last meeting, which were approved.

2. The permanent secretary's annual report on the affairs of the association was read and discussed and it was accepted. The principal features of this report are subjoined.

3. The permanent secretary's financial report was accepted and ordered to be audited.

4. A letter from the general secretary was read, mentioning that preparations are in progress for a program on the "Origin of Ideas," for the Boston meeting, under the leadership of Dr. James Harvey Robinson, and that preparations are well advanced for a joint meeting of Section C (Chemistry) with the Physiological Section of the Botanical Society of America, with a program on "Photosynthesis and the Light Relations of Plants."

5. The treasurer was authorized to exchange the association's holdings in U. S. Victory 4¾ per cent. notes, which are to be retired, for 4¼ per cent. U. S. Treasury bonds (1947-1952) of equal face values.

6. The chairman of the Committee on Convocation Week (Dr. J. McKeen Cattell) presented an informal report, which was accepted. This report will appear in SCIENCE.

7. Fifty-seven members were elected to fellowship in the association, on regular nominations approved by their respective section secretaries. The newly elected fellows are distributed among the sections as follows: F, 40; I, 15; L, 1; K, 1. (It is highly desirable that all members who are eligible to fellowship in the association should be elected. Nominations are made by any member on special nomination blanks secured from the permanent secretary's office or from any section secretary.)

8. Certain editorial features of the journal SCIENCE were discussed. It was voted that the present practice be continued of publishing in full the retiring presidential and vice-presidential addresses given at the annual meeting.

9. Several communications from the secretary *pro tem.* of the executive committee for the proposed federation of American biological societies were read and a resolution was adopted stating that the American Association for the Advancement of Science approves the general aims and purposes of the proposed federation, and wishes to cooperate with the federation in all possible ways.

10. A communication recommending action by the association, on the subject of proposed changes in the copyright laws of the United States, was received from Dr. M. L. Raney, librarian of the Johns Hopkins University. The questions thus raised were referred to a special committee, consisting of: Dr. C. L. Andrews, *chairman* (librarian of the John Crerar Library, Chicago); Dr. W. W. Bishop (librarian of the University of Michigan); and Dr. John M. Coulter (head of the department of botany, the University of Chicago), and this committee was requested to make recommendations to the council at the Boston meeting.

11. A communication from Dr. Charles B. Lipman (University of California), writing for the Board of Research of the University of California, and one from Dr. C. A. Kofoid (also of the University of California) were read, regarding the great present need for the preparation and publication of an up-to-date list of serial publications in science, with annotations. The executive committee expressed its approval of these communications but was obliged to defer definite action on this subject till some way may be found by which the association may be able to aid this important project.

12. A communication was received from Dr. Henry B. Ward (of the University of Illinois), recommending that the association adopt a general resolution strongly favoring the scrupulous and complete preservation of the national parks of the United States and Canada, against any form of desecration by any commercial interest. Such a resolution was adopted; its text will appear later in SCIENCE.

13. The permanent secretary was authorized to conduct an intensive membership campaign in the states of New England and New York, just preceding the next annual meeting, this campaign to be based on a special request addressed to every member resident in the specified region, asking him to secure two or more new members for the association.

14. It was unanimously voted that the permanent secretary be instructed to cable and write to Sir Ernest Rutherford, president of the British Association for the Advancement of Science, inviting him to attend the fourth Boston meeting and to deliver an address, probably on Thursday evening, December 28, with the understanding that the association would meet his expenses.

15. The committee adjourned at 6:30, to meet at Boston, at 10 A.M., December 26. The evening was spent in an informal discussion of the affairs and prospects of the association.

BURTON E. LIVINGSTON,
Permanent Secretary

ANNUAL REPORT OF THE PERMANENT SECRETARY

Publications. About 6,200 copies of the "Booklet of Information" have been sent to prospective members. About 6,500 copies of a four-page leaflet have been sent to the medical men of New England, inviting them to become members of the association. At the end of September a calendar card, emphasizing the association year (October 1 to September 30) was sent to each member with the statement of his dues. About 11,700 copies were sent out. Along with the calendar card went an explanatory leaflet on membership.

Circularization for new members. During the fiscal year 1922, 23,933 invitations to join the association were sent to members of affiliated societies. The cards show that 1,114 new members have thus far been secured in this way. The invitations sent out in the circularization of non-members listed in "American

[1] A summary of the annual report of the permanent secretary, on the affairs of the association, for the period from October 1, 1921, to September 30, 1922. Presented to the Executive Committee at New York City on October 21, 1922.

Men of Science" numbered 4,370, and 106 new members have been secured from that group. All members of the Society of Sigma Xi have the privilege of joining the American Association for the Advancement of Science without paying the usual entrance fee, but it has thus far been found impossible to send a special invitation to each of these, on account of difficulty in securing the membership lists of all chapters of the society. All members of the society who are not already members of the association are asked to send their names and addresses and the names of their respective chapters, to the permanent secretary's Washington office. He will send them literature that will be of interest. At the close of the fiscal year 1922, about 16,200 special invitations to join the association were sent to members of affiliated societies. About 6,500 of these invitations went to medical men in New England.

Organization. Each section secretary has received a card list of the members enrolled in his section, with a cabinet for holding the cards. These lists are duplicated in the Washington office, and both sets are kept up to date by additions and alterations.

Each section secretary has been asked to secure a mail ballot of his section committee, for at least two nominations for vice-president and chairman of his section, these nominations to be returned to the Washington office, for the use of the council, on a special blank. It will be remembered that the sections nominate, and the council elects, section chairmen and section secretaries. When a section holds a business session, the nominations secured from the section committee are to be acted on by the section as a whole. More than one nomination is to be presented to the council, in order that the latter body may have opportunity for choice. The council needs also to know how the votes stood in the section committee.

A constitution for the proposed federation of American biological societies was adopted at the Woods Hole meeting, August 4, of the *pro tem.* executive committee for the federation, at which meeting Dr. Herbert Osborn very kindly represented the association. The proposed constitution has been submitted to the council of the association, and should be considered at the Boston meeting, when it will be necessary to decide whether the association will become a member of the new federation. The constitution has been published in SCIENCE (Vol. LVI, No. 1448, p. 359, September 29, 1922). The *pro tem.* committee voted that the aim of the federation would be to make use of the organization of the association, avoiding the duplication of organization wherever possible. It is emphasized by the secretary of the *pro tem.* committee that the main activities of the federation are apt to concern publications, not the organization of meetings. The *pro tem.* committee expressed its thanks to the association for the financial help received in connection with the Woods Hole meeting, and requests the association to continue help of this kind during the formative period of the federation. A similar request has been made of the National Research Council. Copies of the proposed constitution for the federation have been sent by the permanent secretary to all members of the section committees of the four biological sections of the American Association for the Advancement of Science, together with letters asking each member to write to his section secretary in regard to the proposed federation and the attitude that should be taken by the association toward it, a carbon copy of each letter being also sent to the permanent secretary's office. A number of replies have been received and the permanent secretary hopes, with the aid of the four section secretaries concerned, to make a report on this matter to the Executive Committee at the first committee session of the Boston meeting. All members of the biological sections are invited to write to the proper section secretary in this connection, sending copies of their letters to the permanent secretary. To be considered in his report, letters should be in the section secretary's hands before December 1.

Divisions, Local Branch and Affiliated Academies. The membership and financial relations, between the association and the divisions, the local branch and the affiliated academies, are shown for the last three years in the following tabulation:

	PACIFIC DIVISION			SOUTHWESTERN DIVISION			STATE COLLEGE BRANCH	AFFILIATED ACADEMIES		
	1920	1921	1922	1920	1921	1922	1922	1920	1921	1922
Total number of members, end of year	.....	1,190	1,278	.....	156	176	52	851	1,437	1,488
Number of new members received during year	.....	33	61	.....	57	34	20	.....	182	101
Allowances made during year	$1,784	$1,007	$1,126	$108	$131	$149	$27	$818	$1,141	$1,328

Membership. The increase in membership since September 30, 1920, is summarized in the following tabulation:

	Sept. 30, 1920	Sept. 30, 1921	Sept. 30, 1922
Number of members in good standing	10,002	10,160	10,566
Total enrollment	11,442	11,547	11,646

Changes in membership occurring in the fiscal year 1922 are shown below:

	Sept. 30, 1921	Sept. 30, 1922
Total enrollment	11,547	11,646
Number of sustaining members	3	3
Number of life members	346	352
Number of annual members, paid up	9,811	10,211
Total in good standing	10,160	10,566
Number of members in arrears for two years	705	455
Number of members in arrears for one year	682	625
Total enrollment	11,547	11,646

Gain in membership, October 1, 1921, to September 30, 1922:		
Reinstatements	33	
New members (11 life, 1,209 annual)	1,220	
Total gain		1,253
Loss in membership, October 1, 1921, to September 30, 1922:		
Dropped because of non-payment of dues	705	
Resigned	362	
Died	87	
Total loss		1,154
Net gain, October 1, 1921, to September 30, 1922		94
Transfers from annual to life membership		4

Special attention may be directed to the marked increase in paid-up membership for the last two years, owing to the very efficient work of the executive assistant and his staff. Paid-up membership for the three years 1920, 1921 and 1922 was 10,002, 10,160 and 10,566. The rate of increase in paid-up membership from 1920 to 1921 was about 50.5 per cent. higher than was the corresponding rate of increase in total membership. From 1921 to 1922 the rate of increase in paid-up membership was about four times as great as was the corresponding total membership rate of increase. It seems that membership in good standing is a much better index of our growth than is total membership, and this feature is very gratifying.

Financial Affairs. The permanent secretary's annual financial report for the fiscal year 1922 will be published in SCIENCE after the annual meeting, at which time a statement regarding the permanent secretary's budget for 1923 will be made.

BURTON E. LIVINGSTON,
Permanent Secretary

REPORT OF THE COMMITTEE ON CONVOCATION WEEK[1]

THE committee on convocation week appointed by the council of the American Association for the Advancement of Science at the Toronto meeting, and consisting of J. McKeen Cattell, Chairman, Herbert S. Jennings, J. Playfair McMurrich, Eliakim Hastings Moore and Edwin Bidwell Wilson, begs to report as follows:

Twenty years ago the first convocation week meeting of our national scientific societies was held in Washington, from December 29, 1902, to January 3, 1903. Prior to that time the American Association for the Advancement of Science with the societies affiliated with it had

[1] This report has been presented to the executive committee and approved. It is printed in advance of the Boston meeting in order that consideration may be given to the recommendations that are made prior to their presentation to the council.

held annual meetings in the summer; the American Society of Naturalists, with an affiliated group of societies in the natural sciences, had met in the Christmas holidays. Others of the national societies had met at various times and places.

The summer meetings of the American Association were found unsatisfactory owing to the difficulty of traveling and the wide dispersion of scientific men at that season. There had been a gradual development in the direction of making the American Association an affiliation of scientific societies responsible for their own programs, and the special programs of the sections of the association were becoming less important. After long discussion, it was consequently decided to transfer the meeting to the Christmas holidays, and to make closer the affiliation with the national scientific societies.

A committee, of which the late Professor Charles S. Minot was chairman and the chairman of the present committee was secretary, proposed and arranged a convocation week meeting of the American Association and other national societies to be held during the week in which New Year's day falls. The plan was to let the meeting follow Christmas day, at a sufficient interval to allow scientific men to spend the first part of the Christmas holidays at home, devoting the second half to the scientific meetings. Extensive correspondence was conducted with universities and colleges and about sixty leading institutions agreed either to let their Christmas holidays include the entire week in which New Year's day falls, or in case that were not possible to give leave of absence to those who wished to attend the meetings.

It was thought that the official recognition of convocation week would lead the authorities of the universities and other institutions to realize that attendance at scientific meetings is a part of the academic duties and privileges of their teachers. Efforts, in part successful, were also made to obtain payment of traveling expenses by the institutions.

A further part of the plan of convocation week was to hold a greater convocation of scientific, and perhaps also of learned, societies once in four years, in alternation in Washington, New York and Chicago. It was proposed that at the intervening two-year periods the association should meet in a large central city, where there would be accommodation for all the societies to meet with it. In the alternate years—the end of the year of odd numbers in the calendar—the meeting would be held in a smaller or more remote city, and in this case it was assumed that many of the scientific societies would prefer to meet singly or in groups, often in smaller university towns. This plan has since been carried out, the four-year convocation meeting, for example, having been held at the end of 1920 in Chicago, with a very large representation of national scientific societies and scientific men. The meeting last year was held in Toronto, a smaller city, where, however, the arrangements were admirable and the attendance large. The meeting this year will be at Boston, where the facilities are ample for a large meeting.

A difficulty has, however, occurred owing to the prescientific arrangement of the calendar, according to which the same day of the week does not coincide with the same day of the month. When New Year's day came early in the week, many institutions resumed their regular work in the middle of that week, and scientific men found it difficult to be absent to attend meetings of scientific societies at the beginning of their work. The present committee was appointed with special reference to this difficulty, but was authorized to report on other problems connected with convocation week.

This year Christmas occurs on Monday and it was not regarded as feasible to postpone the meetings to the following week. The council at Toronto appeared to be nearly equally divided among three alternatives—holding the meeting during Christmas week, extending it over Sunday, or postponing it to New Year's week. It was finally decided to hold the opening session on Tuesday. This has obvious disadvantages—it shortens convocation week by a day; it requires most members of the societies who wish to be present at the opening to leave home on or before Christmas day; it does

not allow a day in advance of the meeting for preparatory meetings of councils and committees. When Christmas occurs on Tuesday, as it does next year, the balance of the week is too short for the meetings of the different societies, for it is desirable that to a certain extent they meet successively rather than simultaneously in order to avoid conflicts in the programs.

Our committee has decided to recommend that when New Year's day falls on Thursday, Friday or Saturday, convocation week shall begin on Monday of that week and extend through the week; when it falls on Sunday, convocation week shall begin on Tuesday of Christmas week and shall continue five days; when Christmas day falls on Monday, Tuesday or Wednesday, convocation week shall begin two days later, namely, on Wednesday, Thursday or Friday, the meetings being continued to include, respectively, Tuesday, Wednesday or Thursday of New Year's week.

It is suggested that meetings acceptable to scientific men and to the community might occur on Sunday. Such would be meetings of councils and committees held at headquarter hotels, and perhaps public lectures. Indeed lectures might be given in the churches as is the custom at meetings of the British Association which always includes Sunday in its week of meeting. It may also be suggested that one of the main objects of scientific meetings is to bring scientific men together for acquaintance and conversation, and that Sunday could be utilized for such personal meetings, as also for smaller excursions, for informal dinners and the like.

The situation in which there appears to be most occasion for difference of opinion is when Christmas day falls on Monday or Wednesday. It might in these cases be desirable to meet the day after Christmas, so that in the first case the meeting could be completed in Christmas week and in the second case not extend beyond Wednesday of New Year's week. The committee, however, recommends that the official opening dates be two days after Christmas, though of course any society could place its first meetings on the day after Christmas and the council of the association and other councils and committees must meet on that day.

In addition to the convocation-week meetings during the Christmas holidays, it seems desirable that the association should resume regular summer meetings. The sections need not be fully organized, and it would not be expected that most of the affiliated societies would meet. The four summer meetings that have been held since the establishment of the winter convocations—in Ithaca, Hanover, San Francisco and this year in Salt Lake City—have been enjoyable to those able to be present and useful to the communities, to science and to the association.

The country is large; scientific men are many and have diverse interests. The association should aim to be of service to all in so far as this is possible without sacrifice of other interests. A meeting in summer, smaller and more informal than the winter meetings, more sectional in character, enables the association to visit universities and places not suited to a large winter meeting or impossible when there is only one meeting a year. Excursions and social features may be arranged for a summer meeting, which give it an individual character.

The committee proposes that in addition to migratory convocation-week meetings during the Christmas holidays and meetings in summer, it may be desirable to standardize other times and places for scientific meetings, more especially for meetings of committees, boards and the like. In many such groups, for example, in practically all the committees of the National Research Council, there are men working in different sciences, and the cost and time of travel could be economized if several meetings were held on the same or consecutive days.

We consequently suggest that it would be an advantage to scientific organization and research if committee and similar meetings were called in Washington in the fourth week in April; in New York City in the latter part of Thanksgiving week; in Chicago about the first of February, and in Wood's Hole in August. This would give a convenient distribution both in time and place for such meetings.

The committee does not regard convocation

week meetings during the Christmas holidays as necessarily final. There is much to be said for placing convocation week in the scholastic year, so that attendance at the meetings may be regarded both by teachers and administrators as part of the privileges and duties of scientific men. It is doubtful whether students would suffer by the absence of part of their teachers for a week, and it is certain that it would be to their advantage for their teachers to attend scientific meetings. It is further the case that neither midsummer nor midwinter is the best time for traveling or for the holding of meetings. Apart from inconvenience, dysentery in summer and colds in winter are a common sequence. A convocation week in autumn or in spring might be best for scientific men and ultimately in the interest of the institutions with which they are connected.

It is perhaps not necessary for the committee to enter into a discussion of the advantages and disadvantages of large meetings. The inter-relations of the sciences are so fundamental, however, that it is difficult to make separation in time and place of meetings of societies that is not inconvenient to some and perhaps adverse to the development of inter-relations that are important for the advancement of science. It is also the case that a large meeting may impress the magnitude and importance of science on the general public. In addition it may be noted that it is not so difficult either for executive officers or for hosts to arrange for one large meeting as for many small meetings, and there are other extrinsic advantages, such as reduced railway rates.

On the other hand, it is desirable for men whose work is in the same science to meet together intimately, and the social arrangements for a small and isolated group are usually more agreeable than those for a large gathering. The compromise that has been worked out appears to be working with reasonable success, namely, that there be a general convocation-week meeting once in four years in three large scientific centers, Washington, New York and Chicago. In New York and Chicago, at least, there is ample accommodation, so that societies can have headquarters and places of meeting that will give them any desired degree of isolation.

It might also be useful to arrange a twelve year schedule for convocation-week meetings of the second class, say, in Philadelphia, Baltimore, Pittsburgh or Buffalo four years hence; in St. Louis, Cincinnati, Columbus or Cleveland eight years hence; in Boston again, or in another New England city, such as Providence, Worcester or New Haven, twelve years hence. Then it might be convenient to arrange a provisional schedule for minor convocation-week meetings for the alternate years, including those cities mentioned when not selected for the twelve-year rotation and cities such as Montreal, Toronto, Albany, Rochester, Richmond, Louisville, Atlanta, Nashville, New Orleans, Houston, Indianapolis, Detroit, Kansas City, Omaha, Minneapolis, Denver, Salt Lake City, San Francisco, Los Angeles, Portland and Seattle.

The committee consequently recommends that all national scientific societies arrange to meet in Washington at the end of the year 1924, in New York in 1928 and in Chicago in 1932, and arrange their intervening meetings with a view to this program. The council of the American Association, which is primarily composed of representatives of the affiliated societies, will in accordance with its present policy arrange places of meeting that will be convenient for all societies for the intervening even years, namely, 1926, 1930, etc. For the intervening odd years the association will arrange a program for places of meeting to which the affiliated societies will be welcome, but which will, as a rule, be in cities that are smaller and more distant from the center of scientific population. The meeting at the end of 1923 will be in Cincinnati.

In pursuance of these considerations the committee recommends the following resolutions for passage by the council:

Resolved, That the greater convocation-week meetings of the American Association for the Advancement of Science and the affiliated national scientific societies be continued as for the past twenty years at four year periods in succession in Washington, New York and Chicago, and that all national scientific societies be invited and urged to join in these meetings.

Resolved, That a corresponding twelve-year cycle of meetings for the intervening two-year periods be arranged for large cities in succession in the New England, the Central and the Atlantic States, in which it is desirable that the national scientific societies join.

Resolved, That a provisional schedule of meetings in other cities for the odd years be arranged in advance for the convenience of the scientific societies that may find it desirable to meet with the association.

Resolved, That arrangements be made for a summer meeting in 1923.

Resolved, That scientific councils, boards and committees can to advantage hold their meetings in Washington during the fourth week of April, in New York at the end of Thanksgiving week, in Chicago on or about February 1, and in Wood's Hole in August.

Resolved, That Convocation-Week be the week in which New Year's day falls when this is Thursday, Friday or Saturday; that when New Year's day falls on Sunday, it be the preceding week, that when it falls on Monday, Tuesday or Wednesday, it begin two days after Christmas and continue into New Year's week.

J. MCKEEN CATTELL
Chairman

FUNCTIONS OF THE DIVISION OF GEOLOGY AND GEOGRAPHY OF THE NATIONAL RESEARCH COUNCIL[1]

THE purpose of this paper is to ask the geologists of the country what ought to be done with the National Research Council. I do not mean to imply that there is any trouble, or any disappointment, or that the right thing is not being done now. But the council is young, very young, and also very plastic, as it should be. It has the possibilities, and the dangers, of an infant.

It may be well to state first certain dangers that do *not* exist. The organization is *not* likely to die, in the sense of ceasing to exist. If it does there will be left a million dollar building bearing the words *National Research Council* carved in marble along with the words *National Academy of Sciences.* In the second place there is no immediate danger of its not having an organization and officers. The income from a few million dollars of permanent endowment is enough to settle the question of continued existence in some form. So, for better or for worse, the National Research Council is here, probably to stay. But what the council will be like in ten years or fifty years from now is what no man knows.

When all foreseeable possibilities have been assembled, they gravitate into two main groups. The council may become, on the one hand, a dispenser of "grants" or, on the other, an agency for promoting research in other ways, mainly by stimulating, organizing or federating the research activity which arises without grants. In either case money is paid out and research comes in, more directly in the former case, indirectly in the latter. One of the questions for the future will be whether research comes higher by direct purchase or by the more roundabout method.

The above statements apply to the council as a whole, but our own interest is in a single division, Geology and Geography, which is one of seven covering Science and Technology. It does not follow that the seven will, or ought to, develop alike. Exactly opposite divisional tendencies are among the possibilities and may even prove desirable.

Before setting forth more fully the option which lies before geologists, it will be well to describe more exactly several of the possible functions of a national council of scientific men. On the approach of war in 1916-17 it suddenly became necessary to find out what was known and who knew it; also what had to be done and who could do it. It was mainly for such purposes that the National Research Council was organized under the Council of National Defense. The details of this war organization were not suited to times of peace, but the central idea held over, namely, that it paid to get scientific men together in groups to take stock of what had been done and what is being done and to advise together concerning the things that remain to be done, especially those which ought to be done soon.

[1] Published in advance to be discussed at a round table of the Geological Society of America at Ann Arbor, December 28. Discussion to be led by David White.

No other purpose can be so basic as this one of taking stock and surveying the field. It is the most essential business of men acting together. As a corporate function it can stand on its own merits with or without other functions. This step is worth while whether another is taken or not. This is the answer to the question—What can we do if we do nothing else? What is worth while if we can do only one thing? It is not yet certain to what extent this function will be realized by the council. If it is not satisfactorily performed, then some future president of the United States may have to send out another call as Lincoln did in 1864 and as Wilson did in 1916, asking scientific men to get together and tell us where we are at in science. The function thus described may hereafter be referred to as that of General Survey. Its inevitable complement is the giving out of information. This double function is the basic duty of the Research Information Service. The figurative term "Clearing House" is often used and is not inappropriate.

A second function is that of coordinating researches and of inspiring and organizing new ones. It is inevitable that any body of men performing the first function described above will be consulted by others who have problems on hand. About the first question a man asks when face to face with a new problem is: What has been done on this question by others? Who else is working on it now? If I am willing to do my share of a task too big for one man, how can I get the other phases taken care of? So the organizing and coordinating of work follows so naturally on the clearing house function that it would be difficult to keep out of it.

A third line of activity is found in financing projects. Not all valuable projects require financing. Much valuable energy needs only organizing and coordinating. The council may be a vital agency with or without the financial function. In the original plan the financial function was nowhere distinctly specified; certainly not regarded as essential.

It will be well to explain here in just what sense the council or any one of its divisions may be said to be paying out money for research. (1) The chairmen of the divisions of Science and Technology and other necessary officers are salaried. (2) Within certain limits, traveling expenses are paid. This applies to officers on duty and to members of divisions and committees in attending certain meetings of their respective bodies; also in some cases to other men invited to participate in conferences on problems and projects. (3) A staff of technical helpers is maintained for the clearing house work of the Research Information Service. (4) When all the expenses of running the organization (not here enumerated) have been paid, there remains a moderate sum to be allotted in small amounts to committees for the actual expenses of research. For the most part such sums are given merely to clear the way for starting projects which are expected to be otherwise supported. The expression "priming the pump" has been used, and describes the intention fairly well.

The great bulk of the money thus far expended under the auspices of the council has been obtained by solicitation by and for the individual division or committee having charge of a project. Generally the donor gives it for a specific purpose. Thus the responsibility for finding the money has been largely on the men whose project was to be supported. It is necessary to make this point clear, lest the impression should prevail that some men are *beneficiaries* of the Research Council in a sense that other men are not. There is no scramble to "get in on the deal," for when the pushers of a certain project have gotten in, they are still in large measure responsible for its support. I say "in large measure"; it is of course true that they enjoy the advantage of having their project stamped with the approval of twenty or more representatives of their own science, picked from the nation, and with the further approval of a body representing all sciences, whose business it is to distinguish the *most worth while* from the merely *desirable*. In addition to this advantage, there is sometimes some actual aid in solicitation by the general officers of the council and a special committee on Funds and Projects.

These are the only ways in which money is

dispensed for research. It should be plain from this that the democratic or representative character of the council, designed, as it was, to express the combined judgment of scientific workers, is not in any way impaired by the function of making "grants" or selecting a list of "beneficiaries."

If the council is ever to become a dispenser of funds, the change would no doubt come about through such a growth of confidence in its work that much larger donations would be made with less and less question as to their use. It is not impossible that this will occur, but the indications that point that way do not affect our division and need not be mentioned here.

As the great question before the geologists of our country is the use which they can make of their own division, and as the possibility of raising money is often a part of that question, it will be wise to examine briefly the sources of the support thus far obtained for other purposes. The several scientific divisions differ enormously in the financial support which they have been able to command. Should this difference be regarded as a measure of efficiency or merely as an indication of difference in method? Ought Geology and Geography with equal leadership and diligence to have captured their "share" of the more than half a million dollars donated for Physics and Chemistry, or of the like amount given to Medicine? These questions may not be answered positively, but it will help some if we inquire what relation the donors have borne to the objects of their donations. In other words—What has been the nature of the "appeal" in each case? When we have finished this analysis we may ask whether Geology should be going to its friends with similar appeals.

The largest donations have come from corporations holding large trust funds whose income *must* be distributed. Each one of these corporations specializes more or less in certain fields of science and generally elects to make its donations in fields related to its central interest. Thus the Rockefeller Foundation is known to be interested in Medicine and its contributory sciences. In addition to the five million dollars given by the Carnegie Corporation for endowment and building, well over a million dollars have been pledged for research by various trusts of similar character.

Another large class of donations, aggregating to date a few hundred thousand dollars, have had for their object some improvement of technique of manufacture or other ultimate advantage in production. The donors to such projects generally represent commercial interests in the corresponding fields of industry. The researches subsidized are of fundamental character but their relation to industry or trade is sufficiently patent to afford a strong appeal to producers. Examples of this class are found in the donations for the Critical Tables of Physical and Chemical Constants and in the support of the Crop Protection Fellowships. A slightly different appeal, looking toward preservation rather than production, is found in the support of the Marine Piling Investigation.

A smaller amount must be credited to pure philanthropy or public spirit. In these cases the donor can hope for no return in the way of personal profit, as when a great retail merchant gives the money for a biological fellowship. While less than one hundred thousand dollars given directly to scientific work comes under this classification, it is fair to mention the one hundred and eighty-five thousand dollars contributed by twenty friends to purchase the site for the building.

Lastly, a few thousand dollars have been contributed by states toward cooperative researches, such as reforestation and highway problems. The appeal here is for state aid in what is properly a state function.

With this classification of donors and appeals before us, geologists should be able to run down the list and form some idea whether their science is in position to make effective appeals for money. The list of great trusts is not long and the general field that each one favors is known. Geology is by no means excluded from their interests (recall, *e.g.*, the Carnegie Corporation and the Shaler Memorial Fund) but in no case is it likely that the National Research Council would be asked to

handle their donations. If the measure of usefulness of a division is found in the funds it handles, this would be discouraging. If, on the other hand, the division is primarily interested in seeing the science advance, the situation may be quite ideal. Illustrations might be given of projects first fostered by the Division of Geology and Geography and then "turned over" to other agencies.

Is there anything in the field of Geology analogous to the interests which manufacturers have in the improvement of production through study of fundamental principles? Could mining men be asked to get together and finance a study of structural geology or geochemistry? To put down the answers which these questions suggest would take more space than is permitted. The most obvious answers would not encourage such hopes for the immediate future.

Can we appeal to men on the basis of pure public spirit or scientific interest? Certainly Geography does this, if exploration may be called geographic investigation. It is quite true that money thus donated might not generally pass through the hands of the National Research Council, but that is a mere detail so long as the Council inspires the undertaking.

Almost the same may be said of state and federal funds. Little if any of this will appear on the accounts of our division, but it would be surprising and ought to be disappointing if we do not influence the work of official surveys even to the extent of inducing them in some cases to take up definite projects.

The general impression from such a casual analysis might be that our division can not well expect to be asked to administer large donations for geologic research. More largely than any other science, Geology is regarded as a governmental function and no one likes to subscribe to a governmental deficit. An observer from the outside might say that Geology is already pretty well supported. Of course geologists know it is not. But ours is not the only family whose poverty is known better inside than outside.

As for Geology in private employ, largely in mining and drilling, there remains a peculiar assumption of private interest and the value of secrecy. The pooling of interests to support researches in basic problems has not gone so far among mining men as among steel manufacturers, as the Research Council and the Engineering Foundation have good reason to know.

On the other hand the United States Geological Survey and some state surveys, despite all we say when our humor is bad, do provide deliberately for some research in pure science, and the by-product of pure science from both public and private work is large. The nature and amount of such by-products is determined largely by individual interests, as it should be. But it would be all folly to deny that there is much fine enthusiasm resulting in scattered and sometimes fruitless effort; mere lost motion. There are strategic points and timely moves in science as in war. The kind of guidance that comes from cooperation and the fullest possible knowledge of what others are doing ought to be profitable. Can the Research Council supply these elements?

The situation here referred to is exemplified in the work of our committee on Sedimentation. A few years ago it was tacitly assumed that the manner of origin of sedimentary rocks was completely stated in our elementary texts. Then individual workers began to raise questions. Interest appeared at many points and contributions began. When the Research Council was reorganized on a peace basis one of the first demands made on this division was that it organize the study of Sedimentation. The result has been a tripling of the work and, better still, a conscious planning to send workers into the darkest parts of the field. Other sciences have been drawn on for assistance. Men have been newly inspired by finding that their own little studies were highly useful in a big problem. The work may go on a few years more. There is little doubt that, fifty years hence, men will point back to the decade embracing these researches as a time in which the study of sedimentary rocks was raised to a new scientific level.

Now a point to be emphasized is that the Research Council is paying out no money for this research except for occasional conferences. The work is being done by skilfully appropri-

ating the opportunities offered by surveys and universities. It can scarcely be said that men have left other studies for this work. In most cases they have merely been asked to direct their efforts toward a certain point, or to have in mind their bearings on another principle.

Having set forth something of various ways in which the Research Council works, it should scarcely be necessary to guard scientific men against certain misconceptions. There have been such and they have done some harm.

The first of these possible misconceptions is that the council was designed to superintend research workers and see that they did the right thing; perhaps to assign problems to this and that man and to tell others what fields to keep out of. Such a situation is purely imaginary. No doubt some newspaper writers, not knowing the ways of science, did give utterance to such dreams, but they should not have deceived scientific men.

Another assumption, less absurd but just as wrong, is that the council is an "institution" carrying on researches on its own account. It has no laboratories, not even a library, except a few reference books. It hires no investigators. It is merely a *mode of cooperation.* There is something almost fallacious about speaking of the Council as "it"; there is no *it;* nothing but *we.* The council does nothing except what men in groups have always been trying to accomplish. The only valid claim is that men's combined efforts are being spent to better advantage. Geologists *always have* conferred, analyzed their problems, cooperated and looked around for help. The only question before us is whether such activities can be facilitated by a bit of machinery for conference, correspondence, record keeping and administration.

To guard against misunderstanding it should be stated explicitly that it is highly desirable that the Division of Geology and Geography should have funds for its own projects. But the point which needs emphasis just now is that the thing which is to *justify the existence* of the Research Council is something quite different. When the geologists of our country have definitely adopted the National Research Council as a *mode of operation* they should by all means undertake to enlarge its usefulness by financial aid.

NEVIN M. FENNEMAN
NATIONAL RESEARCH COUNCIL,
WASHINGTON, D. C.

NATIONAL RESEARCH COUNCIL'S MEDICAL FELLOWSHIPS

EARLY this year the Rockefeller Foundation and the General Education Board jointly pledged to the National Research Council for the administration, through its Division of Medical Sciences, of medical fellowships the total sum of $500,000, payable annually through a period of five years in sums not to exceed $100,000 a year.

A special board for administering these fellowships was selected with the approval of the National Research Council and the two foundations. The board is composed of the following members with the chairman of the Division of Medical Sciences of the Natiional Research Council (at present Dr. F. P. Gay, professor of bacteriology, University of California) as chairman, *ex officio;* David L. Edsall, professor of medicine and dean of the Medical School, Harvard University; Joseph Erlanger, professor of physiology, School of Medicine, Washington University, St. Louis; G. Carl Huber, professor of anatomy and director of the anatomic laboratories, University of Michigan; E. O. Jordan, professor of bacteriology, University of Chicago; W. G. MacCallum, professor of pathology and bacteriology, Johns Hopkins University; Dean D. Lewis, professor of surgery, Rush Medical School, Chicago; Lafayette B. Mendel, professor of physiological chemistry, Yale University; W. W. Palmer, professor of medicine, Columbia University.

This board met for the first time on April 18, 1922, and in this and subsequent meetings outlined certain regulations that should govern their decisions in connection with the appointment of fellows and the method and place of their work. Since that time two additional meetings of the board have been held for the purpose of appointing fellows from the list of

applications that have been received. The most essential points decided upon by the board are the following:

(1) The fellowships are designed primarily for research as fundamental to a teaching career in one of the medical sciences. For this latter reason it is prescribed that the fellow must work where facilities for, but not obligations in, teaching are afforded.

(2) The fellowships are for full time and basal salaries of $1,800 for unmarried men and $2,300 for married men have been determined. Salaries in either of these grades may be larger than the minimum, depending upon the number of dependents and the locality chosen by the candidate for work.

(3) The place of work and the subject chosen for investigation are determined by the candidate with due consideration for the feasibility of the plan proposed. It has been decided that the work may be carried out either in this country or abroad.

The first fellows have been appointed and are now at work. In spite of the fact that the funds for these fellowships generously donated by the Rockefeller Foundation and General Education Board were not available and that announcements concerning the fellowships could not be made until relatively late in the year numerous applications have been received and twenty-six candidates have already been accepted.

The fellows so far appointed cover the whole group of the specialities of medicine and are divided as follows:

Pathology and bacteriology	5
Medicine	5
Surgery	6
Physiology	4
Biochemistry	2
Anatomy	1
Medical specialties	1
Pharmacology	1
Physical chemistry	1

The work is now being carried out in various medical centers as follows:

Harvard	7
Columbia	3
Chicago	3
Hopkins	3
Cincinnati	2
Ohio	1
California	1
Iowa	1
Northwestern	1
Cornell	1
Yale	1
Leipzig	1
New York Post Graduate Hospital	1

F. P. GAY,
Chairman, Division of Medical Sciences,
National Research Council

LIST OF FELLOWS

The following is a complete list of fellows so far appointed:

Albritton, Errett C., A.B. Missouri, M.D. Johns Hopkins, Mayfield, Ky. Ohio State University; endocrine physiology.

Andrus, William D., A.B., M.A. Oberlin, M.D. Johns Hopkins, Oberlin, Ohio. University of Cincinnati; surgery.

Anson, Barry J., A.B. Wisconsin (has equivalent of Ph.D. degree), Muscatine, Iowa. Harvard Medical School; embryology and histology.

Bent, Michael J., M.D. Meharry, San Andres, Republic of Colombia. College of Physicians and Surgeons, New York City; bacteriology and hygiene.

Cone, William V., B.Sc., M.D. Iowa, Iowa City, Iowa. Iowa State University; neuropathology.

Connor, Charles L., M.D. Baylor College of Medicine, Forsyth, Montana. Harvard Medical School; the etiology of Rocky Mountain fever.

Curtis, George M., A.B., M.A., Ph.D. Michigan, M.D. Rush Medical School, Ann Arbor, Michigan. The University of Chicago; surgery of the hypophysis.

Davis, Loyal E., M.S., M.D. Northwestern, Chicago, Ill. Northwestern University; neuorolgical surgery.

Derick, Clifford L., A.B. Lachute Academy, M.D. McGill, Noyan, Quebec, Canada. Harvard Medical School; medicine.

Ferry, Ronald M., A.B. Harvard, M.D. College of Physicians and Surgeons, Columbia, Concord, Mass. Harvard Medical School; biochemistry.

Josephs, Hugh W., A.B. Harvard, M.D. Johns Hopkins, Baltimore, Md. The University of Chicago; physical chemistry.

Leiter, Louis, B.S., M.S. Chicago, M.D. Rush Medical School, Los Angeles, California. The University of Chicago; pathology.

Lennox, William G., A.B. Colorado College, M.D. Harvard, M.A. Denver, Colorado Springs, Colorado. Harvard Medical School; medicine, especially epilepsy.

MacCready, Paul B., B.S. Princeton, M.D. Johns Hopkins, New York. Johns Hopkins University; laryngology.

McIver, Monroe A., A.B. North Carolina, M.D. Harvard Medical School, Gulf, N. C. Harvard Medical School; pathology.

McLean, Jay, B.S. California, A.M., M.D., M.S. Pennsylvania, Baltimore, Md. The University of Leipzig; surgery.

Mills, Clarence A., A.B. South Dakota, Ph.D. Cincinnati, Cincinnati, Ohio. The University of Cincinnati Medical School; experimental medicine.

Rapport, David, A.B., M.D. Harvard, Cornell Medical College, New York, physiology.

Reznikoff, Paul, B.Sc. New York University, M.D. Cornell Medical College, Brooklyn, N. Y. Harvard Medical School; experimental medicine.

Robinson, Elliott S., A.B., M.D. Yale, New Haven, Conn. Yale School of Medicine; bacteriology and immunology.

Rosenthal, Sanford M., M.D. Vanderbilt Medical School, Nashville, Tenn. Johns Hopkins Medical School; clinical medicine.

Schmitz, Herbert W., B.S. Wisconsin, M.D. Harvard, Manitowoc, Wis. New York Post Graduate Hospital; biochemistry.

Shibley, Gerald S., A.B., M.D. Columbia, Maplewood, N. J. Columbia University; medicine, especially infectious diseases.

Smith, Beverly C., A.B., M.D. Virginia, Franklin, La. Columbia University; toxemia in intestinal obstruction.

Stieglitz, Edward J., B.S. Chicago, M.D. Rush Medical School, Chicago, Ill. Johns Hopkins Hospital; a clinical study of nephritis.

Locke, Charles Edward, Jr., A.B., M.D. California, Special Docteur en Chururgie, Brussels, University of California Hospital, San Francisco. University of California Hospital; neurological surgery.

SCIENTIFIC EVENTS

THE INTERNATIONAL COMMISSION OF EUGENICS

As has been noted in SCIENCE, the International Commission of Eugenics met at Brussels on Saturday, October 7, and Monday, October 9. According to the report in *Eugenical News*, there were present Major Leonard Darwin, *chairman;* Dr. Almert Govaerts, *secretary;* Dr. Van Herwerden of Utrecht, Holland; Dr. Winner, Professor of psychiatry, Copenhagen; Dr. Jon Alfred Mjoen of the Winderen Laboratorium, near Christiania; M. Lucien March of "Statistique générale de la France," and Dr. Pinard, President of the Société Française d'Eugénique, Paris; and Dr. C. B. Davenport, of Cold Spring Harbor.

It was voted unanimously to invite German delegates to the commission. It was decided provisionally to hold the next meeting of the commission at Lund, Sweden, and the next meetings of the Eugenics Congress in 1924 at Prague. These decisions are contingent upon the possibility of making appropriate arrangements for the meetings.

The occasion of the meeting of the International Commission of Eugenics at Bruxelles was taken advantage of for a meeting of the Ligue nationale Belge contre le Péril vénérien at the same place, and an extensive social program was arranged.

On October 7, a lecture was given by Dr. Apert, physician of the hospitals of Paris, entitled, "L'Hérédité Morbide." On October 8, in the morning a joint congress of the Ligue contre le Péril vénérien and Fédérations of Anti-Alcoholic Societies of Belgium was held in collaboration with the Belgian Eugenics Society. In the afternoon there was an excursion to Waterloo, where an address was given by M. Gheude, député permanent, entitled, "Les buts Eugéniques de la Ferme-École." This was followed by visits to the battlefield and to the Ferme-école Provinciale, the new home for the feeble-minded which it is hoped will be ready for occupancy in the spring. On Monday, there was held the second meeting of the commission, and, at 4 o'clock, a visit to the Solvay Institute of Sociology where Major Darwin gave an address entitled "L'Eugénique" and Professor Wimmer of Copenhagen one on "Mental Heredity." At 5 o'clock, the Prison de Forêst and its laboratory of anthropology were visited. On Tuesday, addresses were given by Dr. Daisy M. Robinson, by M. Lucien March, of Paris, and Dr. Berthollet, of Lausanne, on matters partly of anti-veneral and partly of eugenical interest. At half past two in the afternoon, a meeting was held in the large hall of the Solvay Institute of Sociology, at which was inaugurated the eugenics room

of the institute. Two lectures were given on the practical organizations of eugenics, "in the United States" by Dr. Davenport; "in Belgium" by Dr. Govaerts. On Wednesday a visit was made by the Congress to the city of Antwerp.

THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY

THE 1922 annual meeting of the federation will be held on Wednesday, Thursday and Friday, December 27, 28 and 29, at Toronto, Canada, under the auspices of the University of Toronto. The program will be sent out about December 14. An effort to secure special railroad rates is being made. In case these are secured members will be notified. The hotel headquarters are the King Edward. About 100 men can be accommodated, in either single rooms or in suites each with two bedrooms, in the men's residences of the university. About 12 women can be accommodated in one of the women's residences. Breakfast for those living in the residences can be obtained at Hart House. The charge for these rooms will be $3.00 for 3 nights, or $2.00 for 2 or 1 night. Luncheons will be provided on the 27, 28, and 29. Dinners will be followed by a smoker on the evenings of the 27 and 28. All these will be given in Hart House, the student's club, near the residences and the medical building.

The Local Committee is anxious to arrange a large series of demonstrations. As the departments of physiology, biochemistry and pharmacology are all in the one building, facilities of all kinds can readily be arranged. All communications in regard to the same should be addressed to Professor J. M. Olmsted, Medical Building, University of Toronto.

The general meetings will be held in the Physics Building of the university. Meetings of the Constituent Societies will be held in the Medical and Anatomy Buildings of the university, which intercommunicate. The lecture rooms are not distant from each other and it is hoped to have a notice board system, so that the papers to be read in each section will be posted in each other section. Professor Andrew Hunter is chairman and Professor V. E. Henderson is secretary of the local committee.

THE AMERICAN PHYSICAL SOCIETY

THE 24th annual meeting (the 118th regular meeting) of the American Physical Society will be held in Boston on December 26-30, 1922, in affiliation with Section B—Physics—of the American Association for the Advancement of Science. The meetings will be held at the Massachusetts Institute of Technology.

At the session in charge of Section B, Professor G. W. Stewart, the retiring vice-president and chairman of Section B, will give the annual address. This will be followed by a symposium on "Ionization Potentials and Atomic Radiation," and the invited speakers are to be Dr. Paul D. Foote, of the Bureau of Standards, and Professors K. T. Compton and Henry Norris Russell, of Princeton.

Members wishing to present papers at the Boston meeting are requested to send abstracts ready for publication to the secretary before December 9. The secretary expects to send the program to all members before the meeting, but the delays in the mails are so great at present that members should not depend upon the program to determine their attendance.

Other meetings for the current season are as follows:

119. February 27, 1923. New York.

120. April 21, 1923. Washington.

121. Time not determined. Pacific Coast Section.

DAYTON C. MILLER
Secretary
CASE SCHOOL OF APPLIED SCIENCE,
CLEVELAND, OHIO

THE MATHEMATICAL ASSOCIATION OF AMERICA

THE seventh annual meeting of the Mathematical Association of America will be held at Room 11, Sever Hall, Harvard University, December 28-29, 1922, in conjunction with the American Mathematical Society and Section A of the American Association. At a joint session of these three bodies the following papers will be read:

Reduction of singularities of plane curves by birational transformation: PROFESSOR G. A. BLISS, University of Chicago, retiring president of the society.

The grafting of the theory of limits on the calculus of Leibniz: PROFESSOR FLORIAN CAJORI, University of California, representing the association.

Geometry and physics: PROFESSOR OSWALD VEBLEN, Princeton University, retiring vice-president of Section A of the American Association.

At the Friday morning session the following papers will be given:

Period of the bifilar pendulum for finite amplitudes: PROFESSOR H. S. UHLER, Yale University.

Skew squares: PROFESSOR W. H. ECHOLS, University of Virginia.

On the averaging of grades: PROFESSOR C. F. GUMMER, Queen's University.

Mathematics at Oxford and the Ph.D. degree: PROFESSOR W. R. BURWELL, Brown University.

Some unsolved problems in the theory of sampling: PROFESSOR B. H. CAMP, Wesleyan University.

Some unsolved problems in solid geometry: PROFESSOR J. L. COOLIDGE, Harvard University.

It is of special note that the session on Friday afternoon will be devoted to a "Symposium on Mathematical Statistics," for the purpose of strengthening the existing entente cordiale between mathematicians on the one hand and practicing statisticians on the other. It is hoped that this symposium will be of real service, not only to those who are giving courses in statistics in departments of mathematics, but also to others who may be interested in the application of mathematics to statistical problems. The following papers will be read:

The subject matter of a course in mathematical statistics: PROFESSOR H. L. RIETZ, head of the department of mathematics at the State University of Iowa, and chairman of the National Research Council's Committee on the Mathematical Analysis of Statistics.

Time series of economic statistics: their fluctuation and correlation: WARREN M. PERSONS, professor of economics at Harvard University, and editor of the *Review of Economic Statistics*, published by the Harvard Committee on Economic Research.

The fundamental concepts of the calculus of mass variation: ARNE FISHER, statistician of the American Telephone and Telegraph Company, and author of "The mathematical theory of probabilities and its application to frequency curves and statistical methods." The discussion will be opened by RAYMOND PEARL, professor of biometry and vital statistics in the School of Hygiene and Public Health, Johns Hopkins University, and statistician of the Johns Hopkins Hospital.

CHEMISTRY AT THE BOSTON MEETING OF THE AMERICAN ASSOCIATION

THE Boston meeting of the American Association for the Advancement of Science will undoubtedly be the most important to chemists of any of its meetings held for years. Papers on research work completed or in progress are now invited from the chemists of the country. In addition to such papers as may be submitted there will be a symposium on "The Progress of Chemistry," and a second symposium on "Photochemistry and Plant Physiology," in which the leading chemists of the country will discuss these subjects. In addition the American Physical Society will continue the series of symposia begun last year jointly with the Mathematica and Chemical Societies. The subject will be "Ionization Potentials and Atomic Radiation," and the speakers will be Paul D. Foote, K. T. Compton and Henry Norris Russell.

The following list gives the papers already arranged for in connection with the symposium on the progress of chemistry: "Compressibilities and the size of atoms," by Theodore W. Richards, of Harvard University; "Proteins and the theory of colloidal behavior," Jacques Loeb, of the Rockefeller Institute; "X-rays as related to the structure of atoms and of crystals," William Duane and also George L. Clark, both of Harvard University; "Changes in volume during the solution of solids," Gregory P. Baxter, of Harvard University; "The chemistry of the photographic process," C. E. K. Mees, of the Eastman Kodak Company; "The present status of the theory of complete ionization," D. A. MacInnes, of the Massachusetts Institute of Technology; "The present status of the theory of incomplete ionizaion," James Kendall, of Columbia University; "Ionization potentials and chemical action," W. A. Noyes, Jr., and "The separation

of isotopes," by R. S. Mulliken, both of the University of Chicago. In addition a number of other topics, not yet fully decided upon, will be discussed by noted chemists.

At the symposium on photochemistry and plant physiology to be held Thursday, December 28, at 2 p. m., H. A. Spoehr, of the Desert Laboratory, will discuss "Photosynthesis," S. E. Sheppard will speak on "Photochemical reactions," and a third speaker will present the subject "Carbohydrate metabolism."

The address of the retiring vice-president and chairman of Section C will be upon the subject "The nuclei of atoms and the general system of isotopes."

It is expected that one or two of the sessions will be provided with a program by nearby sections of the American Chemical Society as follows: the Northeastern, the New York, the Eastern New York, the Cornell, the New Haven, the Philadelphia, the Washington, and the Delaware sections.

Speakers have been invited to present papers on atomic structure, the electron theory of valence, the nature of metals, the work of various great laboratories, and various other topics of interest to professional chemists. It should be noted that no specific invitations have been sent out for papers on the research work of individuals, but it is hoped that the chemists of the United States and Canada will respond in considerable numbers to the general invitation given in the present notice. The titles of such papers should be sent as soon as possible either to the retiring chairman, Professor W. D. Harkins, of the University of Chicago, to the secretary of the Northeastern Section of the American Chemical Society, Professor E. B. Millard, of the Massachusetts Institute of Technology, Cambridge, Mass., or to the vice-president and chairman, Professor W. Lash Miller, of the University of Toronto.

SCIENTIFIC NOTES AND NEWS

AT the anniversary meeting of the Royal Society on November 30, its awards are to be conferred as follows: Royal medal to Professor C. T. R. Wilson, for his researches on condensation nuclei and atmospheric electricity, and to Professor J. Barcroft, for his researches in physiology, especially in respiration; the Copley medal to Sir Ernest Rutherford, for his researches in radioactivity and atomic structure; the Rumford medal to Professor Pieter Zeeman, for his researches in optics; the Davy medal to Professor J. F. Thorpe, for his researches in synthetic organic chemistry; the Darwin medal to Professor R. C. Punnett, for his researches in the science of genetics; the Buchanan medal to Sir David Bruce, for his researches and discoveries in tropical medicine; the Sylvester medal to Professor T. Levi-Civita, for his researches in geometry and mechanics; and the Hughes medal to Dr. F. W. Aston, for his discovery of isotopes by the method of positive rays.

AT the formal opening of the University of Paris, honorary degrees of doctor of laws were received by Ambassador Herrick on behalf of Elihu Root, Esq., Dr. A. Lawrence Lowell, president of Harvard University, and Professor Albert A. Michelson, of the University of Chicago.

DR. M. C. WHITAKER, chemical engineer of New York City, has been awarded the Perkin medal "for the most important contribution to applied chemistry made by any citizen of the United States," by the Society of Chemical Industry. The presentation will be made by Dr. Charles F. Chandler.

AT the meeting of the Ophthalmic Section of the American Medical Association, Dr. Frederick H. Verhoeff, of Boston, was awarded the Knapp Medal for his paper on "Ghoinas of the Optic Nerve." Dr. Verhoeff is president of the New England Ophthalmological Society.

THE British Institution of Mining Engineers has awarded its medal to Sir George Beilby, "in recognition of his valuable contributions to science, with special reference to his researches on fuel."

MR. R. T. A. INNES, the union astronomer at Johannesburg, has received the degree of doctor of science from the University of Leyden.

DR. ADOLPH LOEWY, professor of physiology at the University of Berlin, has been appointed director of an institute at Davos, Switzerland, for research on the physiologic effects of residence in high altitudes as pertaining to the treatment of tuberculosis.

THE November number of the *Journal of Geology* at the University of Chicago will bear the names of father and son as editor and managing editor, the former being Thomas C. Chamberlin, professor emeritus of geology, and the latter Rollin T. Chamberlin, associate professor of geology. From the founding of the journal twenty-nine years ago T. C. Chamberlin and the late R. D. Salisbury were the editors. The other editors are Stuart Weller, invertebrate paleontology; Edson S. Bastin, economic geology; Albert Johannsen, petrology; and J. Harlen Bretz, stratigraphic geology. Associate editors include representatives of Great Britain, France, Germany, Norway, Sweden, Australia, and Canada.

DR. WILFRED H. OSGOOD, curator of zoology of the Field Museum of Natural History, and party, including Mr. H. B. Conover and Mr. C. C. Sanborn, of the Field Museum, sailed on November 16 for Valparaiso, Chile. They will proceed to the forested region of southern Chile about Corcovado Gulf and, after making general collections there, will work northward. Dr. Osgood and Mr. Conover will return via Argentine, Uruguay and southern Brazil about the middle of 1923 and Mr. Sanborn will remain in the field until 1924.

WE learn from the *Journal* of the American Medical Association that the U. S. Public Health Service has begun a study of the methods used in the United States in the manufacture of biologic products. Passed Assistant Surgeon W. T. Harrison has started a tour of the country to investigate this subject, going to Toronto, Canada; Boston; New York, Otisville and Pearl River, N. Y.; New Brunswick, N. J.; Philadelphia, Swiftwater, Glenolden, Ambler and Mariette, Pa.; Asheville, N. C.; Buffalo, and Baltimore.

DR. SAMUEL J. MORRIS, professor of anatomy at the West Virginia University School of Medicine, has obtained a year's leave of absence to study anatomy at the Harvard Medical School.

DR. ALEŠ HRDLIČKA has returned from an extended trip to Western and Central Europe made for the purpose of visiting the more important recently discovered sites of early man, and of examining the skeletal remains. As the result of a special invitation by the minister of education of the Czechoslovak Republic, he delivered also a series of lectures on "Anthropology and man's evolution" at the Universities of Prague, Brno (Brün) and Bratislava (Pressburg), and at the People's University of Plzeň (Pilsen).

PROFESSOR F. KRAUSE, of the University of Berlin, is now in Mexico City giving a course of lectures on nerve surgery.

PROFESSOR D. PAHLE, of the University of Frankfort, Germany, arrived in Chicago on November 18. Under the auspices of the American Society for the Control of Cancer, he will give a series of demonstrations of the deep-therapy roentgen-ray machine at the Norwegian-American Hospital.

PROFESSOR GEORGE C. WHIPPLE, of the department of sanitary engineering of Harvard University, will give a series of lectures on "The philosophy of sanitation" at the Wagner Free Institute of Science in Philadelphia on Saturday evenings in January.

The educational committee of the Bureau of Standards has arranged with Professor A. Sommerfeld for a course of lectures on "Quantum Theory" and related subjects. These lectures will be given at the Bureau of Standards, Washington, D. C., early in March, 1923.

PROFESSOR A. J. CARLSON, as the guest of the University of Nebraska Medical College on November 17, delivered two addresses, one before the student body and the other before the faculty.

THE Harben lectures before the Royal Institute of Public Health will be delivered by Professor Theodore Madsen, M. D., director of

the State Serum Institute, Copenhagen, on December 1, 4 and 5. The subjects of the lectures are: "Specific and unspecific antitoxin production," "Antitoxic treatment," and "The influence of temperature on antigren and antibodies."

LORD BALFOUR has arranged to deliver his second course of Gifford lectures on natural theology at Glasgow University. The first will be given on Friday, November 24, the series being continued on November 28 and December 1, 5, 8, 12, and 15 and 19, and January 16 and 19. The lectures, which are open to the public, were begun during the session before the war.

AT Lake Forest College there has recently been reorganized a Science Club, which has been dormant since the departure of Dr. James G. Needham in 1901. The departments of chemistry, biology and psychology are sponsors for the club and supervise the bi-weekly programs, the purpose of which is to stimulate interest in the general problems of the three fields. All persons in the vicinity interested in science are invited to attend. The following are the topics and leaders for the first three meetings: "Hypnotism," by Dr. W. R. Wells; "The tropism theory as a basis for the interpretation of human behavior," by Dr. W. H. Cole, and "The constitution of matter," by Dr. F. B. Coffin.

THE three concluding addresses in the series of illustrated evening lectures given this autumn by the Carnegie Institution of Washington, are as follows: November 28, "The constitution of the hereditary material and its relation to development," Dr. T. H. Morgan, research associate in biology of the Carni, and professor of experimental zoology at Columbia University; December 5, "The properties of matter as illustrated in the stars," Dr. Henry Norris Russell, research associate of the Mount Wilson Observatory and director of the Princeton University Observatory; December 12, "The motions of the stars," Dr. Walter S. Adams, acting director of the Mount Wilson Observatory.

AN Exhibition of Scientific Apparatus and Products will be an important feature of the approaching Boston meeting of the American Association for the Advancement of Science, to be held in the building of the Massachusetts Institute of Technology, in Cambridge, December 26 to 30, 1922. Those desiring to take part by exhibiting apparatus, materials, etc., should communicate at once with Professor R. P. Bigelow, Massachusetts Institute of Technology, Cambridge, Massachusetts. Professor Bigelow is chairman of the subcommittee on exhibits for the Fourth Boston Meeting.

APPLICATION has been made for reduced railroad fares, on the certificate plan, for persons attending the annual meetings of the Geological Society of America, the Paleontological Society, the Mineralogical Society of America, the Society of Economic Geologists, the Association of American Geographers and the American Association of State Geologists, in Ann Arbor, Michigan, December 26-31, 1922. When purchasing tickets at the regular one-way fare, certificates of the standard form should be obtained from the railroad ticket agent. The granting of return tickets at one half the regular fare is conditional upon there being 250 persons in attendance upon the meetings who hold certificates showing that they have paid 67 cents or more on the going trip.

FOR the purpose of commemorating the services of William Thompson Sedgwick to the cause of biology and public health, there has been established a memorial lectureship in the department of the Institute of Technology which he created. The desire of the founders is that the Sedgwick Memorial Lectures shall be given from year to year by men of distinguished eminence in any one of the subjects comprehended within the general scope of biology and public health in order that it may fittingly express the deep and broad sympathy of the man whom the lectureship is designed to honor. The committee in charge of the lectureship consists of Samuel C. Prescott, Massachusetts Institute of Technology; Edwin

O. Jordan, University of Chicago; George C. Whipple, Harvard University; Gary N. Calkins, Columbia University, and Charles-E. A. Winslow, Yale University. The first William Thompson Sedgwick Memorial Lecture will be given in Huntington Hall, 491 Boylston Street, Boston, on Friday, December 29, at five o'clock, by Dr. Edmund Beecher Wilson, Da Costa professor of zoology at Columbia University, on "The physical basis of life." The lecture will form part of the program of the meeting of the American Association for the Advancement of Science, the American Society of Naturalists and other societies during convocation week.

IT is announced from Stockholm that since it has been decided not to award the Nobel Prize for Medicnie for 1921, the prize will be added to the Special Medical Fund. The 1922 prize is reserved for next year.

THE Méthane Association, organized in 1916 with the object of advancing industrial chemistry in Poland, has been reorganized as an Institute of Research, and Professor Moscicki has been appointed director. The government of Poland has made a grant of land in the neighborhood of Warsaw, where buildings for the institute will be erected.

WILLIAM EASTMAN STANDOW, a graduate of the University of Denver and a graduate student at Columbia University, was killed by an explosion in the chemical laboratory on November 17, through the explosion of a chamber containing aniline hydrochloride.

PROFESSOR JEREMIAH GEORGE MOSIER, for twenty years in charge of the work in soil physics at the University of Illinois, died on November 10, 1922, at the age of sixty years. A correspondent writes: Professor Mosier graduated from the University of Illinois in 1893. He then became an assistant in geology in the same institution, in which position he served for three years. After a period spent in high-school teaching he reentered the service of his university in 1902 to take up the work in soil physics, a subject which at that time was largely undeveloped. Professor Mosier was an unusually inspiring teacher and he has won the love and respect of the hundreds of students who have come under his instruction. In his field of investigation his interest was broad; but some of the problems which engaged his especial attention were the prevention of soil washing on hilly land, the effect of cultivation, climatological observations, and the soil survey of Illinois, upon all of which topics he made notable published contributions. Professor Mosier's chief interest lay, perhaps, in the soil survey of Illinois, he having been in direct charge of the mapping since the beginning of the survey. Under his direction about four fifths of the state have been mapped. Through his long experience in this connection, he acquired an expert knowledge of soil types that made of him a widely recognized authority in soil classification.

UNIVERSITY AND EDUCATIONAL NOTES

THE $1,600,000 financial development project for Dickinson College and Pennington Seminary has been brought to a successful conclusion. Of this amount, Dickinson, it is reported, will receive $1,250,000 and Pennington $350,000. The money will be used for buildings, betterment, liquidation and endowment.

GROUND has been broken for the new laboratory of the department of hygiene and bacteriology of the University of Chicago, which when completed will be devoted to bacteriologic and chemical research. It will be erected at a cost of $50,000.

UNDER the will of the late Sir William Dunn a further sum of £45,000 now accrues to the School of Biochemistry of the University of Cambridge, making a total gift for the purpose of the school of £210,000.

PAUL MARTYN LINCOLN, of Cleveland, Ohio, has been elected professor of electrical engineering and director of the School of Electrical Engineering in Cornell University. Professor Lincoln, who is a practicing engineer, was professor of electrical engineering at the University of Pittsburgh from 1911 to 1915. He was president of the American Institute of Electrical Engineers in 1914.

CHARLES HARLAN ABBOTT, PH. D. has resigned his position at the Massachusetts Agricultural College to accept the professorship of

zoology at the University of Redlands, California.

DR. J. R. CURRIE, a senior medical officer of the Scottish Board of Health, has been appointed to the chair of preventive medicine in Queen's University, Kingston, Ontario.

DR. H. STANLEY ALLEN, of the University of Edinburgh, has been appointed to the chair of natural philosophy in the United College, St. Andrews, which has become vacant by the retirement of Professor Butler.

DISCUSSION AND CORRESPONDENCE

FINANCIAL SUPPORT OF TECHNICAL JOURNALS

IT is a not uncommon practice for members of the faculties of our colleges, universities, and other schools to enrich the libraries of these institutions by donating copies of technical journals received by the individual either by subscription or by virtue of membership in some scientific society. This loyalty to the local institution is natural and laudable from the standpoint of the institution, but it may, perhaps, not be realized that if every one of our colleges and universities were to depend upon such gifts for their files of scientific periodicals there would shortly, in the case of many such publications, not be any journal to donate, so inadequate is the financial support of scientific publications.

With the exception of those journals, such, for example, as the chemical journals, which have a large and financially profitable circulation among practical workers outside of libraries and faculties, many of our journals devoted to pure science are barely, or not at all, able to exist except for generous subsidies. Outside of members of societies of which the publications may be the official organ, paid subscriptions may be expected only from a very few individuals not members, from a very small number of public libraries in our larger cities, and from educational institutions.

It is a matter of record that many of our journals devoted to publishing the results of research do not have subscriptions from more than a small fraction of American institutions maintaining a department in the given science, and in many cases this results because some member of the departmental staff contributes his personal copy to the library.

One of our biological journals recently faced the necessity of either securing a generous additional subsidy, or of increasing its subscription rate by one dollar a year, or of suspending publication. The subsidy was not forthcoming and so the subscription price was advanced. Notice to this effect was followed by cancellation of subscription, not by one of our private, struggling, small colleges, but by one of the largest of our state universities. The letter of cancellation stated that the institution would hereafter depend upon a donated copy.

The existence of all of the journals of the class referred to is a matter of vital importance to the colleges and universities. None of them is maintained for its own sake as a business venture. Practically all of them were established because of the impossibility of securing the publication of the results of research with any degree of promptness—often not within a year or eighteen months, or even longer, after the completion of the manuscript.

Our colleges and universities should regard practically all of these journals as established primarily for their advantage, and the journals in turn are justified in expecting support from these institutions to the extent of at least one subscription. The donation of personal copies by professors to the library of their institution may help the library to the extent of a few dollars, but the present extent of this practice is depriving journals, indispensable to donor and benefactor alike, of hundreds of dollars each of support annually.

It is an interesting but regrettable fact that, while it is comparatively easy to obtain money for research, nothing is much more difficult to secure funds for than the publication of the results of research.

C. STUART GAGER

ACOUSTICAL RESEARCH

THE quotation from the London *Times* on the subject of Acoustical Research (November 3, 1922) conveys an impression which seems to need correction.

In justice to the life-long labors of the late Professor W. C. Sabine, now gathered into a volume of Collected Papers on Acoustics (Harvard University Press), it should be said that the practical problem of predicting the acoustics of an ordinary auditorium in advance of its construction, or of correcting one already built, was solved by Professor Sabine some twenty years ago. The essential feature to be considered in such a problem is the reverberation and Sabine's papers on this subject are full and complete. Other acoustic questions are, of course, sometimes involved such as the transmission of sound through walls, the effect of resonance, etc. Several of these had also been the subject of prolonged experimental investigation by Professor Sabine at the Jefferson Physical Laboratory at Harvard but some of the results were withheld until the work could be completed. His untimely death interrupted this program, and since then the work has been continued here and at the Acoustical Laboratories at Riverbank, Illinois, under the direction of Dr. Paul E. Sabine, as described in Mr. Munby's article in *Nature*, October 28, 1922.

Architects in this country have become aware of the importance of Sabine's results and scores of cases could be cited in which the application of the principles worked out by him has led to complete success. The opinion that "Architects are still unable to predict with certainty the acoustic properties of the halls and chambers they design" implies a lack of respect for Sabine's profoundly accurate and thorough work which I am sure no one will maintain who has taken the trouble to acquaint himself with the subject.

THEODORE LYMAN,
Director
JEFFERSON PHYSICAL LABORATORY,
HARVARD UNIVERSITY

AUSTRIAN SCIENTIFIC PUBLICATIONS

TO THE EDITOR OF SCIENCE: The present financial difficulties of scientific and technical journals have no doubt come to the attention of many readers of SCIENCE. I am tempted to call their attention to a specific case by quoting a recent letter from William Ford Upson, American trade commissioner in Vienna:

> On a pathetic appeal of Professor Wilhelm Exner, an eminent Austrian scientist, president of the Technisches Versuchsamt, I am sending to the Bureau of Standards, with my compliments, the *Mitteilungen des Technischen Versuchsamtes* for one year. The publication is in sore straits for lack of funds and its ambition is to get 100 foreign subscriptions at $1.00 per year each, to enable it to continue publication, but its efforts have proved unavailing except that I am sending out a few copies at my own expense. Could you help in the good work in any way?

The Bureau of Standards is already a subscriber to this publication, but I trust that the above appeal will put other research laboratories or libraries on the subscription list.

WILLIAM F. MEGGERS
BUREAU OF STANDARDS

AN APPEAL

ONE hundred Russian university and professional men, mostly scientists, many of them internationally famous, recently exiled from Russia by the Soviet government, are in Berlin in serious circumstances. Local charity is housing and feeding them, but they lack sufficient clothing, shoes and pocket money to get through the winter without acute distress. An appeal has come to the American Relief Administration for one thousand dollars to provide some relief (averaging only $10 a man) for these exiles. Unfortunately all of the A. R. A. funds must be spent for relief inside of Russia. The appeal has been turned over to me. Will the scientific men of America help these suffering scientific men of Russia?

A generous friend, Princess Cantacuzene, of Washington, has given me one half ($500) of the sum needed. I shall be glad to be one of fifty to give $10 each, or one of one hundred to give $5 each, to make up the other half. I will undertake to receive the gifts and send personal receipts for them, and later obtain and publish in SCIENCE a blanket receipt from Berlin for the whole amount received and sent over-seas.

VERNON KELLOGG
NATIONAL RESEARCH COUNCIL,
WASHINGTON, D. C.

SPECIAL ARTICLES

ORGANIZATION OF HETEROTYPIC CHROMOSOMES

IN a recent article H. C. Sands[1] gives a preliminary account of his interpretation of chromosome structure in *Tradescantia*. This account seems to differ much in fundamentals from the results of a study conducted by the writer on various species of the South African Liliaceous genus *Gasteria*. To consider only the most interesting feature, the heterotypic chromosomes, we find first that at metaphase there are three pairs of small chromosomes in the center of the plate, with four pairs of much larger ones arranged in radiating fashion around them. In favorable material it is easy to see that the metaphase chromosomes are organized internally into chromomeres, though these are somewhat irregularly arranged. Even before they separate the larger chromosomes each show a cleft at the outer end opposite the fiber attachment, and before anaphase is far advanced they are nearly completely divided longitudinally into two halves. Usually this is entirely completed before telophase sets in, and the halves are widely separated. The smaller chromosomes are slow to split, but finally do so. Consequently there is at telophase a diploid number of separate chromosome-halves and the homotypic division has been prepared for.

As the larger chromosomes separate in anaphase it is clear that in each half-chromosome there is a double row of rounded chromomeres. These are few and apparently quite definite in number, well separated from each other and stain sharply in contrast to the almost colorless matrix. As the membrane first appears around the group of telophase chromosomes (which are well separated in this genus and easily studied) it becomes evident that there are no longer two rows of chromomeres, but that four are now present. When the chromosomes are obliquely placed these can clearly be distinguished, especially in the later stages when the chromosomes begin to broaden at the ends in preparation for a more even distribution of the chromatin in the interkinetic nucleus. The smaller roundish chromosomes show comparable changes, though less clearly because of their size. It would seem that this can only mean that both the gametophyte divisions in the pollen grain have been completely prepared for. The chromomeres which enter the construction of the sperm nuclei seem to be already formed and merely awaiting the mechanical distribution of these mitoses. Unfortunately it has not been possible to trace the history of the chromomeres as such through these two divisions.

By a method based on smear preparations it has been possible to largely confirm the results of sectioned material and to obtain fixations in which synizesis (synapsis) has been almost entirely eliminated. The best results on the anaphase and telophase stages were obtained when the dividing cells were pressed from the anther before fixing and embedding.

The writer would consider, then, that the material worked upon, *Gasteria*, tends to demonstrate a very great precision in the chromomere constitution of the meiotic chromosomes. It is hoped that it will be possible soon to make a full report giving the evidence for the views here expressed.

WM. RANDOLPH TAYLOR
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[1] Sands, H. C.: "Perigenesis," SCIENCE LVI, 517-518, 1922.

THE INTELLIGENCE OF INDIANS

THE accompanying tables show that if we rank mixed bloods of certain heredity with nomadic and sedentary full blood Indians according to intelligence as indicated by Scale A of National Intelligence Tests the sequence proves to be:

I. Mixed Bloods.
II. Mexicans.
III. Plains and South Eastern Full Bloods.
IV. Plateau Indians, Full Bloods.
V. Navajos and Apaches, Full Bloods.

While the number of cases is small the indications of the measures are consistent with this inference. The results will shortly be reported more in detail by the writer who has been giving these tests in United States Indian Schools of the Southwest.

THE RELATIVE INTELLIGENCE OF INDIANS OF NOMADIC AND SEDENTARY TRIBES AND MIXED BLOOD INDIANS

The scores are of the National Intelligence Tests, Scale A, Form 1.

	No. Cases	Score Median	Per cent. attaining Median of PI. & S.E.
12 and 13 years:			
Mixed Bloods	15	103	80 per cent.
Mexicans	145	85	60 per cent.
Plains & S. E.	8	76	—
Pueblo	46	64	40 per cent.
Navajo & Apache	12	52	10 per cent.
14 and 15 years:			
Mixed Bloods	39	110	80 per cent.
Mexicans	132	92	70 per cent.
Plains & S. E.	55	85	....
Pueblo	82	80	44 per cent.
Navajo & Apache	19	60	20 per cent.
16 and 17 years:			
Mixed Bloods	41	104	71 per cent.
Mexicans	28	91	54 per cent.
Plains & S. E.	60	90	....
Pueblo	95	78	34 per cent.
Navajo & Apache	30	77	23 per cent.
18 and 19 years:			
Mixed Bloods	31	114	60 per cent.
Mexicans	2	....	....
Plains & S. E.	53	88	....
Pueblo	26	71	30 per cent.
Navajo & Apache	24	77	40 per cent.

T. R. GARTH

UNIVERSITY OF TEXAS
JULY 8, 1922.

THE OPTICAL SOCIETY OF AMERICA

ABRIDGED MINUTES OF THE SEVENTH ANNUAL MEETING[1]

THE seventh annual meeting of the Optical Society of America was held at the National Bureau of Standards, Washington, on October 25, 26, 27 and 28, President Troland presiding.

One hundred and thirteen persons registered as in attendance at the meeting. Eighty-five of these were from outside Washington. The actual number attending at one time or another was probably about 150. The number in attendance at any one time at the sessions for the reading of papers ranged from about thirty to over one hundred.

[1] The complete minutes including abstracts of papers and descriptions of exhibits will appear in the January number of the *Journal of the Optical Society of America.*

An exhibit of optical instruments was held in connection with this meeting; and visitors were also given an opportunity to inspect the optical equipment of the Bureau of Standards.

The condensed program follows:

OCTOBER 25

Bureau of Standards laboratory exhibits open to informal visits.

Business meeting:
- Reports of officers and general committees.
- Reports of committees on nomenclature and standards.

OCTOBER 26

Glass Plant open to informal visits. Pot of optical glass being stirred.

General session:
- Address of welcome: Dr. S. W. Stratton, director, Bureau of Standards.
- Response: Dr. Leonard T. Troland, president, Optical Society.
- Papers on miscellaneous optics.

Session on solar, stellar and planetary radiation:
- Invited papers by Dr. C. G. Abbot and Dr. W. W. Coblentz.

Glass Plant open to informal visits.
- Moulding, annealing and inspection of optical glass.

Illustrated address (by invitation): Professor W. J. Humphreys, U. S. Weather Bureau, on "The optics of the atmosphere."

Glass Plant open to visitors:
- Pot of optical glass removed from furnace.

OCTOBER 27

First session on physiologic optics.

Second session on physiologic optics.

Special session on physiologic optics for papers by invitation of the committee.

OCTOBER 28

Session on photometry, colorimetry and optical pyrometry.

The exhibit of optical instruments, October 26, 27 and 28.

A synopsis of the proceedings, papers and special features of the meeting is given below:

1. *Business*

The report of the secretary and membership committee was read in part.

The president communicated an informal report from the treasurer, the formal report to be submitted at the end of the fiscal year.

The following reports of general committees were received informally:

Physiologic optics: F. K. Richtmyer, chairman.

Combination of *Journal* with *Instrument Makers' Journal:* J. P. C. Southall, chairman

Ways and means of preparing and publishing an English translation of Helmholtz's "Physiologic Optics": J. P. C. Southall, chairman.

Brief oral reports were made by the following progress committees (committees on nomenclature and standards):

Reflectometry: A. H. Taylor.
Spectroradiometry: W. W. Coblentz.
Visual refraction: A. Ames, Jr.
Wave-lengths: W. F. Meggers.
Photometry and illumination: E. C. Crittenden.
Optical glass: G. W. Morey.
Photographic materials: R. Davis.
Projection: L. A. Jones.
Pyrometry: C. O. Fairchild.
Refractometry: I. C. Gardner.
Spectrophotometry: K. S. Gibson.

2. *Special Papers*

The following papers were given by special invitation:

Apparatus and results of solar radiation work: C. G. ABBOT, Smithsonian Institution.

Thermocouple measurements of stellar and planetary radiation: W. W. COBLENTZ, Bureau of Standards.

The optics of the atmosphere: W. J. HUMPHREYS, U. S. Weather Bureau.

Photic orientation in organisms: S. O. MAST, Johns Hopkins University.

Electrical response of the retina to stimulation by light: E. L. CHAFFEE and W. T. BOVIE, Harvard University.

On reflex visual sensations: FRANK ALLEN, University of Manitoba.

3. *Contributed Papers*

The following are the titles of papers offered by members and others, and actually presented at this meeting:

Reflection of ultra-violet by flowers: F. K. RICHTMYER, Cornell University.

Some unusual halos: W. J. HUMPHREYS, U. S. Weather Bureau.

The excitation of spark spectra of rubidium and cæsium in a low voltage arc: F. L. MOHLER, PAUL D. FOOTE, A. E. RUARK and C. C. KLESS, Bureau of Standards.

Some observations on the transformation of thermal radiant energy into electric current in molybdenite: W. W. COBLENTZ, Bureau of Standards.

Extraordinary diffraction of X-rays: L. W. MCKEEHAN, Bell System Laboratories.

Simple equipment for detecting the errors of screws: WILMER SOUDER, Bureau of Standards.

Refraction of a thin pencil by any refracting surface; generalized meridional and sagittal formulas: E. D. ROE, JR., Syracuse University.

The dioptrometer, an apparatus for measuring the power of the commercial lenses: HENRY F. KURTZ, Bausch & Lomb.

The measurement and specification of optical characteristics in projector performance: G. W. MOFFITT, Frankford Arsenal.

The practical application of parabolic surfaces in lens construction: W. B. RAYTON, Bausch & Lomb.

Some recent contributions to psycho-physiological optics: L. T. TROLAND, Harvard University.

A photo-electric theory of color vision: JANET HOWELL CLARK, Johns Hopkins University.

A theory of color vision: ELLIOT Q. ADAMS, Nela Research Laboratory.

The fundamental facts of color-sensation, being the minimal requirements of a color sensation theory, with illustrations in color: CHRISTINE LADD-FRANKLIN, Columbia University.

The visibility of radiant energy: K. S. GIBSON and E. P. T. TYNDALL, Nela Research Laboratories, Bureau of Standards.

On the luminosity ratios of the spectral complementaries, and the subjective saturation of the spectrum: R. H. SINDEN, Johns Hopkins University.

Further studies of the Abney effect: L. T. TROLAND and C. H. LANGFORD, Harvard University.

A critical study of the Snellen letters and the "illiterate" E tests for the acuteness of vision of school children, and a proposed substitute for these tests: J. M. MCCALLIE, Board of Education, Trenton, N. J.

A comparison of the Fechner and Munsell scales of luminous sensation value: ELLIOT Q. ADAMS, Nela Research Laboratories.

The theory of flicker photometry: C. E. FERREE, Bryn Mawr.

Comparative studies of equality of brightness and flicker photometry with special reference to the lag of visual sensation: GERTRUDE RAND, Bryn Mawr.

Progress on the determination of normal gray light: IRWIN G. PRIEST, Bureau of Standards, Munsell Color Company.

The effect of various conditions upon the determination of the normal stimulus of gray: IRWIN G. PRIEST and CASPER L. COTTRELL, Munsell Color Company, Bureau of Standards.

New tables and graphs for facilitating the computations of spectral energy distribution by Planck's formula: M. KATHERINE FREHAFER, Bureau of Standards.

Graphical aids to the transformation of color measurements from one system to another: HERBERT E. IVES, Western Electric Company.

A color match photometer for illuminants: HERBERT E. IVES, Western Electric Company.

Comparative color measurements of illuminants by trichromatic and monochromatic analyses: HERBERT E. IVES, Western Electric Company.

The colorimetry and photometry of daylight and incandescent illuminants by the method of rotatory dispersion: IRWIN G. PRIEST, Bureau of Standards, Munsell Color Company.

A hemispherical photometric integrator: FRANK BENFORD, General Electric Company.

Improvements in photometric equipment for integrating spheres: A. H. TAYLOR, Laboratory of Applied Science, Nela Research Laboratories.

A variable aperture rotating sectored disc: HERBERT E. IVES, Western Electric Company.

The registering microphotometer of the Mount Wilson Observatory: EDISON PETTIT and SETH B. NICHOLSON, Mt. Wilson Observatory.

Color mixing and comparing apparatus: HERMANN KELLNER, Bausch & Lomb.

Disappearance of the filament in improved forms of the disappearing-filament optical pyrometer: C. O. FAIRCHILD and W. H. HOOVER, Bureau of Standards.

The relation between the hiding-power and reflection coefficients of white pigments and paints: A. H. PFUND, Johns Hopkins University.

On the ratio of intrinsic brightness to illumination: JAMES E. IVES, U. S. Public Health Service.

Preliminary data on the color of daylight at Washington: IRWIN G. PRIEST, Bureau of Standards, Munsell Color Company.

The shrinkage of photographic films during development: H. L. CURTIS, Bureau of Standards.

A special sensitometer for the study of the photographic reciprocity law: LOYD A. JONES, Eastman Kodak Company Research Laboratory.

An instrument (densitometer) for the measurement of high photographic densities: LOYD A. JONES, Research Laboratory, Eastman Kodak Company.

An adaptation of the thalofide cell to the measurement of photographic densities: A. L. SCHOEN, Research Laboratory, Eastman Kodak Company.

On the relation between time and intensity in photographic exposure: LOYD A. JONES and EMORY HUSE, Research Laboratory, Eastman Kodak Company.

Preliminary note on the spectral energy sensitivity of photographic materials: LOYD A. JONES and A. L. SCHOEN, Research Laboratory, Eastman Kodak Company.

The following are titles of papers which were on the supplementary program and whose authors did not respond when the papers were called:

The horopter, cyclophoria and apparent vertical meridian (preliminary report): CHARLES SHEARD, American Optical Company.

Aspherical lens systems: L. SILBERSTEIN, Eastman Kodak Company.

The paper by Hermann Kellner entitled "Motion analyser" on the advance program was not read. In place of it, Dr. Kellner communicated a paper on stereoscopic vision, abstract of which has not been submitted.

Dr. Frank Benford communicated informally the substance of a paper on the plotting of spectrophotometric data which he had presented at the convention of the Illuminating Engineering Society in September.

4. *Exhibit of Optical Instruments*

The following is a list of exhibitors, together with their exhibits.

1. MUNSELL COLOR COMPANY

Munsell color tree.
Atlas of the Munsell color system.
Two enlarged atlas charts.
Neutral value scale, chroma scales.
Munsell daylight photometer.
Munsell crayons.
Munsell water colors.
Color index.
Disc spinning motor for use with Maxwell discs.

2. KEUFFEL & ESSER COMPANY

Holophane lightmeter.
Aerial sextant.
Prismatic gunsight turret telescope.
Expedition plane table.
Engineer's Y level.
Engineer's mountain and mining transit.
Engineer's transit.
Triangulation theodolite.
Spy glass, U. S. Navy pattern.
4-inch ship's telescope.
Anti-aircraft telescope.
Stadimeter.
Color analyzer.

3. ORDNANCE DEPARTMENT, U. S. ARMY

Instruments of the fire control systems of mobile artillery, observation and laying.

Instruments used in the observation and tracking of targets for securing data for precision fire of seacoast batteries.
Observation and computing instruments for use with anti-aircraft batteries.

(Frankford Arsenal Optical Laboratory)

Instrument for the examination of optical glass (designed by G. W. Moffitt).
Universal prism testing instrument (designed by G. W. Moffitt).

4. U. S. COAST AND GEODETIC SURVEY

Astronomical transit (Bamberg).
Theodolite (Troughton & Simms).
Repeating theodolite (Berger).
Precise level.
Vertical circle.
Vertical collimator.
Navigating sextant.
Electric signal lamp.
Heliograph (heliotrope).
Theodolite-magnetometer.
Dip circle.
Magnetograph.

5. BAUSCH & LOMB OPTICAL COMPANY

Large constant deviation spectroscope.
Constant deviation spectroscope for chemists.
Pocket spectroscopes.
Monochromator.
Color mixing and comparing apparatus.
Two field monochromator.
Comparison photometer.
Martens photometer.
Photometer stand.
New Abbe refractometer.
Dipping refractometers.
Colorimeter.
Hemoglobinometer.
Aspheric condenser.
Dioptrometer.
Field telemeter.

6. DR. HARRY S. GRADLE

Instrument for the determination of areas of retinal correspondence.

7. BUREAU OF STANDARDS (RADIOMETRY SECTION)

Stellar spectral radiometer (Coblentz).

8. A. AMES, JR., AND BLANCHE AMES

Color standard.

9. SOCIÉTÉ GÉNÉVOISÉ D'INSTRUMENTS DE PHYSIQUE

Constant deviation spectrometer.
Length comparator for measurements in air.
Automatic machine for graduating micrometer heads, drums, cylindrical and conical surfaces.

10. LABORATORY OF APPLIED SCIENCE, NELA RESEARCH LABORATORIES

Diffuse reflectometer—A. H. Taylor type.
Photometer and special window for integrating spheres.

11. CORNING GLASS WORKS

Light filters.

12. HANOVIA CHEMICAL AND MANUFACTURING COMPANY

Kalosat soft focus lens for photographic use with specimens of photographs taken with Kalosat.
Fused quartz optical goods, microscopic slides, cover glasses, prisms, etc.
Special lenses of fused crystalline quartz.

13. COOPER-HEWITT ELECTRIC COMPANY

Graded fused-quartz-to-Pyrex and fused-quartz-to-lead-glass joints.
Quartz-glass apparatus for photophysics and photochemistry.
Uviarc lamps.
Labarc.

14. BUREAU OF STANDARDS (AERONAUTIC INSTRUMENTS SECTION)

Synchronizing type ground speed and drift indicator.
Rate of climb recorder.

15. A. H. PFUND

A precision rotating section, aperture variable and measurable while in motion.

16. CENTRAL SCIENTIFIC COMPANY

Ingersoll glarimeter, new model.

17. J. C. HUBBARD

Gold-leaf electrometer.

18. BUREAU OF ORDNANCE, NAVY DEPARTMENT

Binocular collimator mark III (manufactured by Naval Gun Factory, Navy Yard, Washington, D. C.).

19. C. P. GOERZ AMERICAN OPTICAL COMPANY

Polariscopes and accessories.
Polariscopes for the analysis of sugar solutions and other polarizing fluids.
Various lamps and accessories.
Refractometers and accessories.
Refractometers, system Abbe, but of new and improved design, for testing fats, oils and other fluids.

20. WARREN P. VALENTINE

Refractometer—Modified Abbe type, "Precision" model.
Refractometer—Modified Abbe type.
Refractometer—Improved "Precision" model.
Refractometer—Modified Butyro type, "Fat" model.

21. BUREAU OF STANDARDS (F. J. BATES)